Michigan Transportation Management Council (TAMC)

Asset Management Implementation in Michigan Local Agencies: Survey Results

Michigan Tech
Transportation Institute

"Meeting our transportation needs through innovative research, distinctive educational programs, technology transfer, and workforce development."

Last Revised: July 18 2012

Authors:
Tim Colling, PhD., P.E.
Belle Wirtanen

Prepared By:
Michigan Tech Center for Technology & Training
Michigan Technological University
1400 Townsend Drive

Contents

Overview

This document details the results of the Local Agency Asset Management Survey, conducted at the 2012 PASER training sessions in various Michigan cities. The survey is intended to allow the Transportation Asset Management Council (TAMC) to the monitor the progress in Michigan's road owning agencies (cities, counties and villages) in the implementation of asset management principles.

The design and development of the survey is detailed in the TAMC report *Asset Management Implementation Survey*[1]. The Key Assessment Factors were based on the Self-Assessment chapter of AASHTO's Transportation Asset Management Guide[2] and a simplified version of the AASHTO document developed for a National Highway Institute (NHI) course on Asset Management[3]. A copy of the survey is available in **Appendix A**. The following Key Assessment Factors outlined in the AASHTO Asset Management Guide provided the basis for the survey questions.

- Policy Decisions
- Identification of Candidate Projects and Treatments
- Effective Data Collection
- Use of Pavement Management Results

Analysis of the Data

The surveys were completed by professionals who attended the 2012 PASER training events. Participants included employees of Regional Planning Organizations and Metropolitan Planning Organizations, the Michigan Department of Transportation (MDOT), consulting agencies, cities, counties, villages, etc.

This report deals specifically with Michigan local agencies. Therefore, only the results of those professionals employed by cities, counties and villages were counted in the survey results. From those participants, the results were further filtered to include only one survey from each city, county or village. The survey submitted by the professional with the most expertise/authority represented the Implementation Scores for their respective agency. For example, a county engineer's survey results were used over that of a truck driver or equipment operator's survey results. Implementation Scores are used in this report as the determining factor for successful implementation of asset management in local agencies.

---

[1] Colling and Kueber. *Asset Management Implementation Survey*. 2011. Michigan Transportation Asset

[2] (AASHTO 2002). *Transportation Asset Management Guide.* Washington, DC: American Association of State Highway and Transportation Officials.

[3] (Zimmerman 2004) Zimmerman. "Sustaning the Use of Pavement Management Within An Organization." *6th International Confrence on Managing Pavments.* Transportation Research Board.

During the 2012 PASER training participants completed 261 surveys, which represented 124 Michigan local agencies. Historically, between 105 and 136 local agencies are present at PASER training which indicates that a good sample of local agencies are represented in this report. Of the 124 local agencies that responded, 93 (73 Michigan counties and 20 Michigan cities) are part of what is commonly referred to as the "Big 124." The Big 124 consists of the largest road owning agencies in the state: MDOT, all 83 counties and the largest 40 cities. As a group, they control over 92% of the public road system. The Big 124 represent 75% of the data sample used in this report. (See Fig. 1)

See **Appendix B-1** for the list of local agencies whose results were analyzed for this report. Of the agencies that completed surveys, counties represented 59% (73 surveys), cities 38% (47 surveys), and villages 3% (4 surveys). (See Fig.2)

Responses for the bridge survey questions were filtered to include only local agencies with five or more bridges. See **Appendix B-2** for the list of local agencies whose jurisdictions have more than five bridges. Of these agencies, counties represented 82% (59 surveys) and cities 18% (13 surveys). (See Fig. 3)

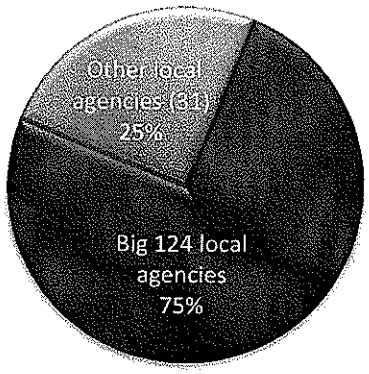


Figure 1 Representation of the Big 124 local agencies in the data sample

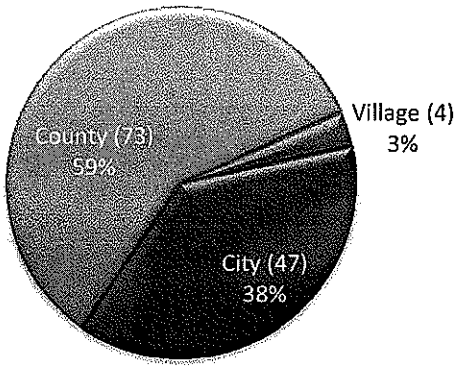


Figure 2 Participating local agencies

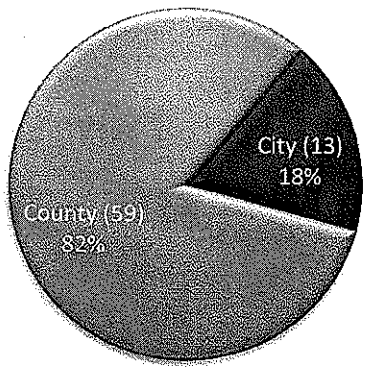


Figure 3 Local agencies with 5 or more bridges

Interpreting the Survey Results

Calculating Local Agency Implementation Scores

Survey questions 4 through 13 relate specifically to local agencies' policies regarding pavement asset management; 15 through 19 concern bridge asset management. Survey answers were designated as positive, negative or neutral. Questions that went unanswered by participants were counted as neutral answers. Implementation scores indicate the percentage of positive responses and were calculated for the bridge and pavement sections separately.

In the report that developed the survey (Asset Management Implementation Survey - 2011) recommended a minimum Implementation Score of 70% or higher to meet the criteria for "successfully implementing" asset management principles in their jurisdiction. This score was recommended by CTT staff, but was not formally adopted by TAMC as a metric. The report recommended monitoring the Implementation Scores over time to determine changes in implementation, but did not discuss the calculation of actual Implementation Scores with respect to neutral or non-response questions.

There are two methods proposed for calculating Implementation Scores based on the calculations derived from *Eq. 1* and *Eq. 2*. It is ultimately up to TAMC to determine which Implementation Score defines successful implementation and how those scores are calculated with respect to neutral and non-response questions.

Equation 1 Percentage of positive answers that include neutral answers

$$\frac{\#Positive}{\#Total} * 100$$

Equation 2 Percentage of positive answers without neutral answers

$$\frac{\#Positive}{\#Total-(\#Unsure+\#Unanswered)} * 100$$

Calculating Implementation Scores using the method in *Eq. 1* may be overly critical in assessing the progress of local agencies' implementation of asset management principles because neutral answers count against local agencies, negatively affecting their Implementation Score. Calculating Implementation Scores using the method in *Eq. 2* is more forgiving in assessing the progress of local agencies' implementation of asset management principles because it removes neutral answers from the calculation, so the uncertainty of the local agency's representative does not affect the Implementation Score.

Local Agency Implementation Scores

The 70% minimum passing Implementation Score was applied to participant agencies calculated from *Eq. 1* and *Eq. 2*. The results from Implementation Score calculation methods are expressed in *Fig.4 through*

7. The Scores reflect the implementation progress in pavement asset management (Fig. 4 and 5) and bridge asset management (Fig. 6 and 7). Histograms displaying the frequency of local agency Implementation Scores based on *Eq. 1* and *Eq. 2* are available in **Appendix C.**

Pavement Asset Management Implementation

Implementation Scores that include neutral answers in their calculation (Eq. 1) reveal that 65% of local agencies have Scores of 70% or higher, indicating successful implementation. Local agencies scoring lower than 70% are equal to 35% of those surveyed. (See Fig. 4)

Implementation Scores that do not include neutral answers in their calculation (Eq. 2) reveal that 76% of local agencies have Scores of 70% or higher, indicating successful implementation. Agencies scoring lower than 70% are equal to 24% of those surveyed. (See Fig. 5)

Bridge Asset Management Implementation

Implementation Scores that include neutral answers in their calculation (Eq. 1) show that 24% of local agencies have Scores of 70% or higher, indicating successful implementation. Local agencies scoring lower than 70% are equal to 76% of those surveyed. (See Fig. 6)

Implementation Scores that do not include neutral answers in their calculation (Eq. 2) show that 39% of local agencies have Scores of 70% or higher, indicating successful implementation. Agencies scoring lower than 70% are equal to 61% of those surveyed. (See Fig. 7)

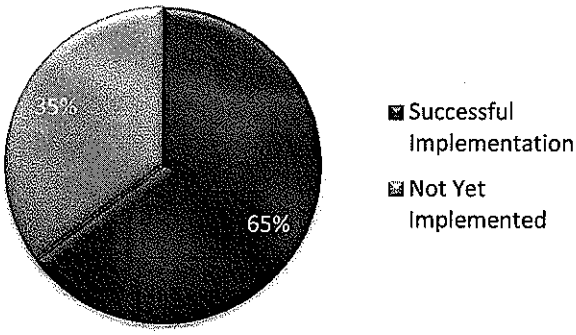


Figure 4 Implementation Scores using *Eq. 1*

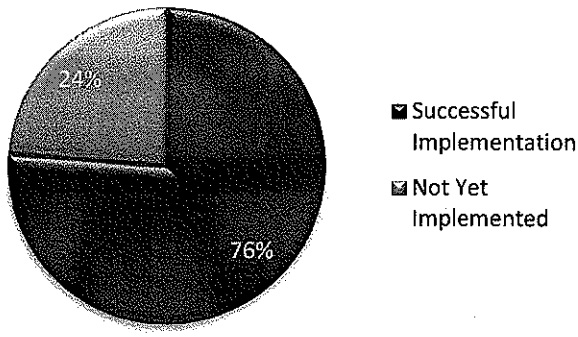


Figure 5 Implementation Scores using *Eq. 2*

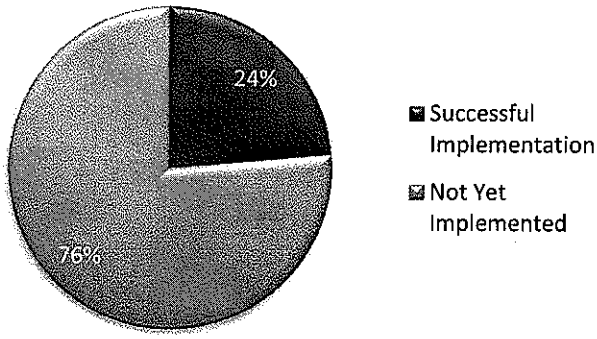


Figure 6 Implementation Scores using *Eq. 1*

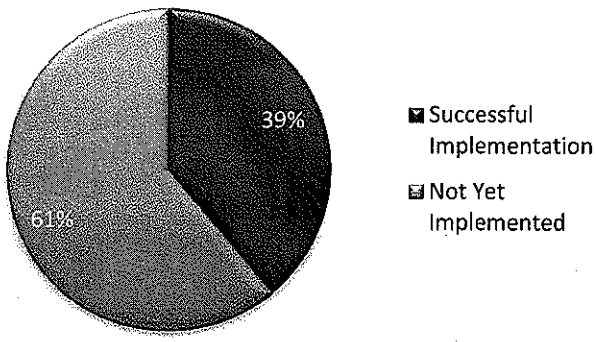


Figure 7 Implementation Scores using *Eq. 2*

Participating local agencies are listed in **Appendix B.** There is a complete list of the 124 participants (**B-1**) and a list of the 72 agencies with more than 5 bridges (**B-2**). Asterisks are used to mark the Big 124 local agencies.

Histograms in **Appendix C** display the frequency of local agency Implementation Scores for pavement asset management (**C-1**) and bridge asset management (**C-2**).

Pie charts and bar graphs in **Appendix D** display answer statistics for each survey question. The percentages of each pavement survey answer based on the 124 local agency responses are detailed (**D-1**). The number of bridges that the 124 local agencies have in their jurisdictions is given (**D-2**). The percentages of each bridge survey question, based on the 72 responses are detailed (**D-3**).

Written comments are detailed in **Appendix E.** The comments are answers to survey questions 14 (**E-1**) and 20 (**E-2**). Comments are sorted into the following areas of relevancy: Constructive Criticism, General Comments/Concerns, and Funding Comments.

Appendix A – Survey Questions

Local Agency Asset Management Survey Questions – 2012 PASER Training

The Michigan Transportation Asset Management Council (TAMC) is interested in determining how Michigan's local transportation agencies are progressing with implementation of asset management. This survey will assist TAMC with their future efforts to promote asset management.

Transportation Asset Management

1. Your name:_____
2. Your position or title: _____
3. Local agency name :_____
4. Does your agency have a written pavement asset management plan with a defined goal for pavement quality?
    a. Yes
    b. No
    c. Unsure
5. Can your agency use its current rating and inventory data to show elected officials and the public the impact of increases or decreases in your agency's budgets on future pavement quality?
    a. Yes
    b. No
    c. Unsure
6. Does your agency periodically assess the benefit (years of life gained) of pavement treatments such as overlays, chips seals, crack seals, etc. with respect to their cost?
    a. Yes
    b. No
    c. Unsure
7. Which method best describes how your agency selects pavement treatment projects?
    a. A "worst first" basis-- reconstructing and rehabilitating failed roads first, then doing preventive maintenance as budget allows
    b. A "mix of fixes" basis-- using preventive maintenance treatments to gain low cost pavement life for good pavements first, then reconstructing or rehabilitating as funding is available
8. Does your agency consider PASER or other distress ratings when deciding on an appropriate fix for a specific section of road?
    a. Yes
    b. No
    c. Unsure
9. Does your agency use a computer based asset management system (such as RoadSoft, Micropaver) or a paper based asset management system (such as the National Center for Pavement Preservation's Quick Check, etc.) to guide decisions on your road network?
    a. Computer based

b. Paper based
c. We don't have an asset management system
d. Unsure

10. On how much of your non-federal-aid, paved road network does your agency routinely (at least once every 3 years) collect distress rating data (PASER or other similar system) and inventory data (pavement type, number of lanes etc.)?
    a. 100%
    b. 75%
    c. 50%
    d. 25%
    e. 0%

11. Which preventive maintenance treatments does your agency routinely use as part of their regular pavement management program? (select all that apply)
    a. Chip seal
    b. Slurry seal
    c. Crack seal
    d. Ultra-thin overlay
    e. Other:_____
    f. We don't routinely use any preventive maintenance treatments
    g. Unsure

12. On what other roadside assets does your agency routinely collect inventory or rating data for asset management? (select all that apply)
    a. None
    b. Signs
    c. Guardrails
    d. Pavement Markings
    e. Culverts
    f. Storm Sewers
    g. Sidewalks
    h. Other_____

13. Does your agency have a method in place for ensuring that the quality of your asset management data is sufficient for its intended use?
    a. Yes
    b. No
    c. Unsure
14. What is one thing that TAMC should do to advance transportation asset management in Michigan?

Bridge Survey Questions:

15. How many bridges with a span of over 20 feet does your agency own?
    a. None (skip questions 16 - 19)
    b. 1 - 2 bridges
    c. 3 - 5 bridges
    d. > 5 bridges
    e. Unsure

16. Does your agency have a written bridge asset management plan with defined goals for bridge quality?
    a. Yes
    b. No
    c. Unsure

17. Does your agency use preventive maintenance treatments such as painting, cleaning expansion joints, cleaning / lubricating bearings, etc., as part of their regular treatment program for bridges?
    a. Yes
    b. No
    c. Unsure

18. Does your agency use a management system like RoadSoft to access NBI data and keep up-to-date bridge maintenance histories for the majority of its bridges over 20 feet?
    a. Yes
    b. No
    c. Unsure

19. Does your agency use bridge condition data to make decisions regarding bridge maintenance and rehabilitation?
    a. Yes
    b. No
    c. Unsure

General

20. Is there anything else you would like to tell us regarding asset management implementation?

Appendix B – Participating Agencies

B-1 All Local Participating Agencies

"Big 124" local agencies are marked with * (93 of 124 responses)

Alcona CRC*	City of Gladwin	Gladwin CRC*	Montmorency CRC*
Allegan CRC*	City of Holland*	Gogebic CRC*	Muskegon CRC*
Alpena CRC*	City of Jackson*	Grand Traverse CRC*	Newago CRC*
Antrim CRC*	City of Kalamazoo*	Gratiot CRC*	Oceana CRC*
Arenac CRC*	City of Kingsford	Hillsdale CRC*	Osceola CRC*
Barry County*	City of Lansing*	Houghton CRC*	Oscoda CRC*
Bay City*	City of Lapeer	Huron CRC*	Otsego CRC*
Bay CRC*	City of Livonia*	Ionia CRC*	Ottawa CRC*
Benzie CRC*	City of Marquette	Iosco CRC*	Presque Isl. CRC*
Berrien CRC*	City of Menominee	Iron CRC*	Road Commission for Oakland County*
Branch CRC*	City of Mt. Pleasant	Ishpeming City	Roscommon CRC*
Calhoun CRC*	City of Muskegon Heights DPW*	Jackson CRC*	Saginaw CRC*
Cass CRC*	City of Norway	Kalamazoo CRC*	Sanilac CRC*
Cheboygan CRC*	City of Novi*	Kalkaska CRC*	School Craft CRC*
Cherlevoix CRC*	City of Port Huron*	Kent CRC*	Shiawassee CRC*
City of Adrian	City of Portage*	Keweenaw CRC*	St. Claire CRC*
City of Alpena	City of Rochester Hills*	Lake CRC*	St. Joseph CRC*
City of Battle Creek*	City of Rogers City	Lapeer CRC*	Tuscola CRC*
City of Big Rapids	City of Saginaw*	Leelanau CRC*	Van Buren CRC*
City of Burton*	City of Saline	Lenawee CRC*	Village of Dexter
City of Cadillac	City of Southfield*	Livingston CRC*	Village of Dundee
City of Cedar Springs	City of Stephenson	Luce CRC*	Village of Lakewood Club
City of Detroit*	City of Trenton	Mackinac CRC*	Village of Webberville
City of DeWitt	City of Walker*	Macomb County Department of Roads*	Washtenaw CRC*
City of Dowagiac	City of Warren*	Manistee CRC*	Wayne County /DPS*
City of East Jordan	City of West Branch	Marquette CRC*	
City of East Lansing	City of Wixom	Mason CRC*	
City of East Tawas	Clare CRC*	Mecosta CRC*	
City of Eastpointe	Clinton CRC*	Menominee CRC*	
City of Escanaba	Delta CRC*	Midland CRC*	
City of Farmington Hills*	Dickinson CRC*	Missaukee CRC*	
City of Fenton	Emmet CRC*	Monroe CRC*	
City of Flint*	Genesee CRC*	Montcalm CRC*	

B-2 Local Agencies with more than 5 Bridges

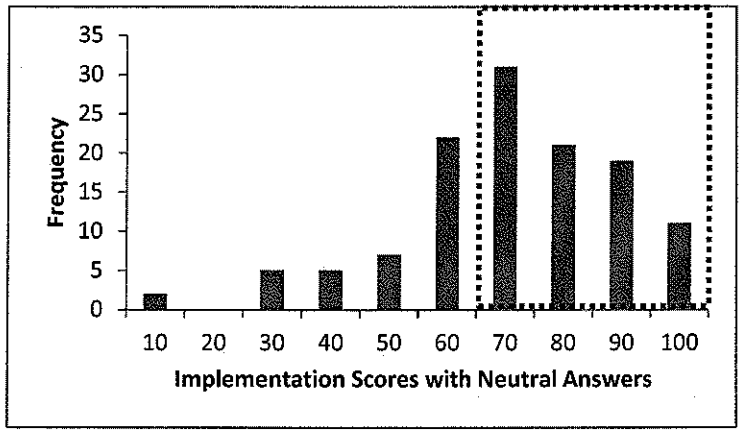
"Big 124" local agencies are marked with * (59 out of 72 responses)

Calhoun CRC*	Lapeer CRC*
Cass CRC*	Lenawee CRC*
Cheboygan CRC*	Livingston CRC*
City of Adrian	Luce CRC*
City of Burton*	Mackinac CRC*
City of Cadillac	Macomb County Department of Roads*
City of Detroit*	Marquette CRC*
City of Escanaba	Manistee CRC*
City of Fenton	Mason CRC*
City of Holland*	Mecosta CRC*
City of Jackson*	Menominee CRC*
City of Kalamazoo*	Midland CRC*
City of Lapeer	Monroe CRC*
City of Marquette	Montcalm CRC*
City of Saginaw*	Montmorency CRC*
City of Walker*	Muskegon CRC*
Clare CRC*	Newago CRC*
Clinton CRC*	Oceana CRC*
Dickinson CRC*	Osceola CRC*
Emmet CRC*	Oscoda CRC*
Genesee CRC*	Ottawa CRC*
Gladwin CRC*	Presque Isl. CRC*
Gogebic CRC*	Road Commission for Oakland County*
Gratiot CRC*	Saginaw CRC*
Houghton CRC*	Sanilac CRC*
Huron CRC*	Shiawassee CRC*
Ionia CRC*	St. Joseph CRC*
Iosco CRC*	Tuscola CRC*
Iron CRC*	Van Buren CRC*
Jackson CRC*	Washtenaw CRC*
Kalamazoo CRC*	Wayne County/DPS*
Kalkaska CRC*	
Kent CRC*	
Lake CRC*	

Appendix C – Implementation Scores

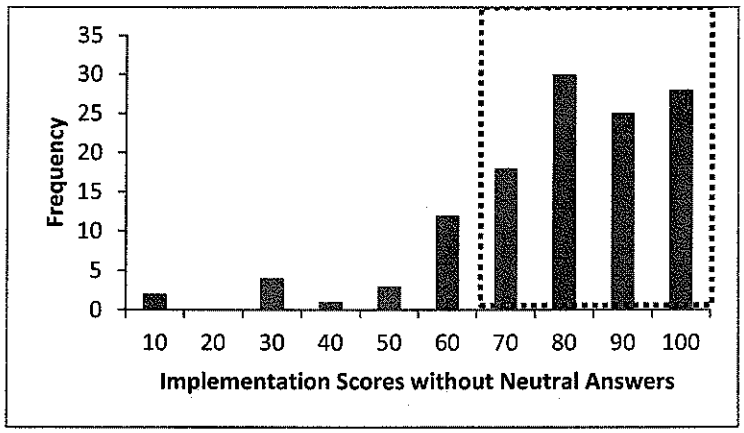
C-1 Pavement Implementation Scores

Implementation Score	Frequency
10	2
20	0
30	5
40	5
50	7
60	22
70	31
80	21
90	19
100	11



Implementation Scores are based on *Eq. 1*

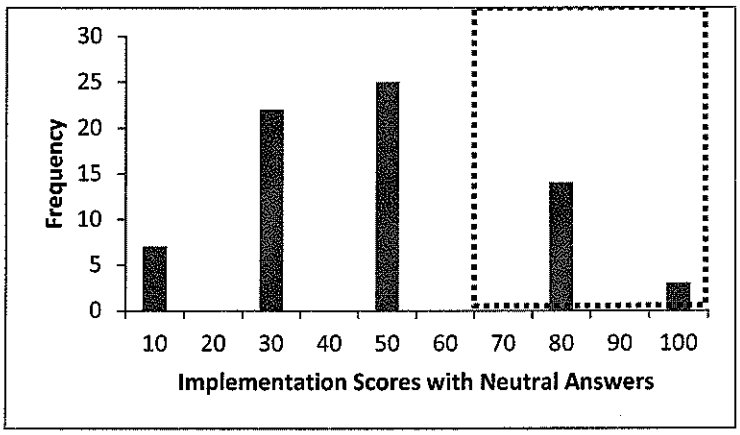
Implementation Score	Frequency
10	2
20	0
30	4
40	1
50	3
60	12
70	18
80	30
90	25
100	28



Implementation Scores are based on *Eq. 2*

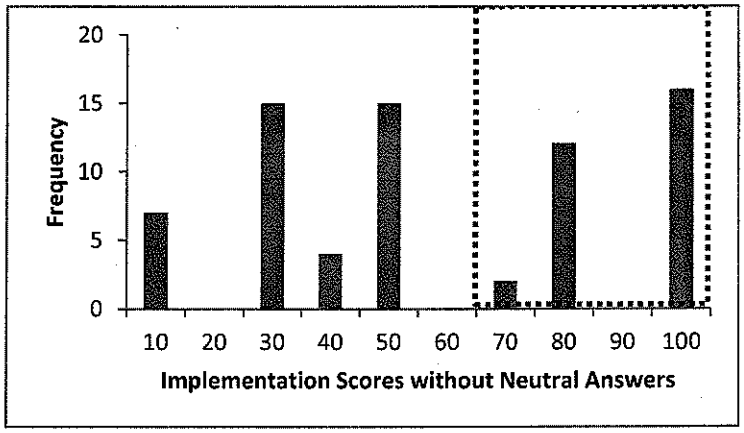
C-2 Bridge Implementation Scores

Implementation Score	Frequency
10	7
20	0
30	22
40	0
50	25
60	0
70	0
80	14
90	0
100	3



Implementation Scores are based on *Eq. 1*

Implementation Score	Frequency
10	7
20	0
30	15
40	4
50	15
60	0
70	2
80	12
90	0
100	16

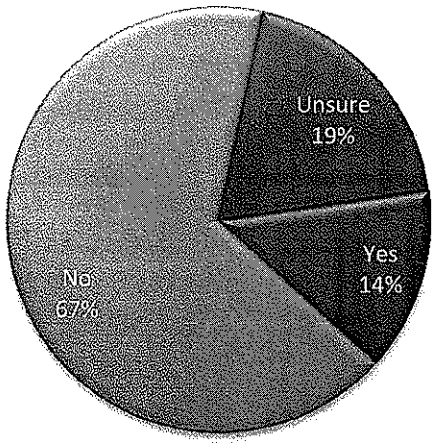


Implementation Scores are based on *Eq. 2*

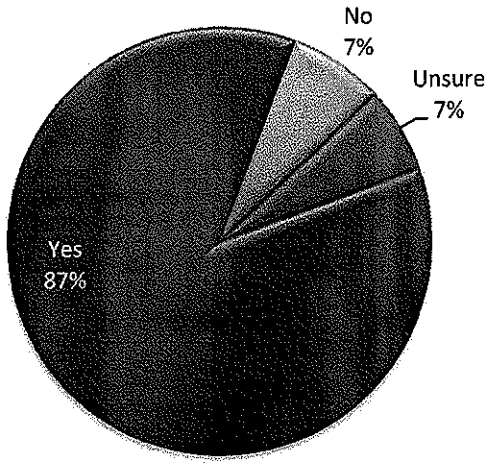
Appendix D

D-1 Pavement Answers (out of 124 responses)

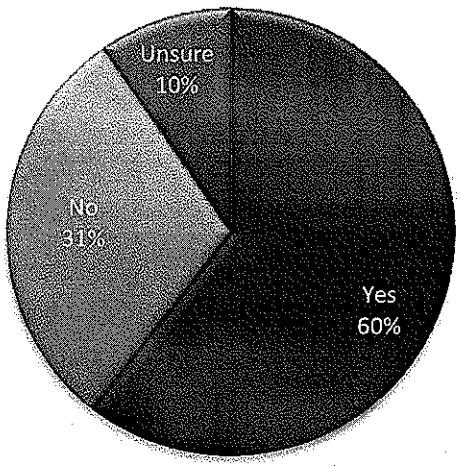
4) Does your agency have a written pavement asset management plan with defined goal for pavement quality?



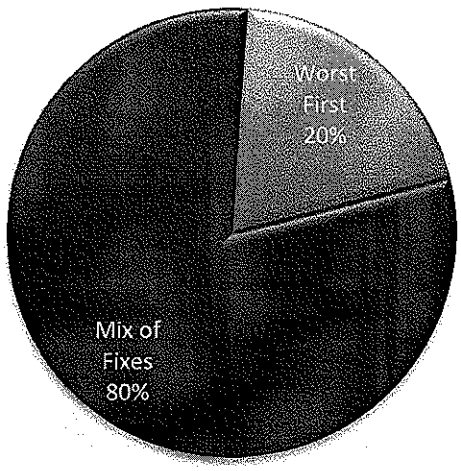
5) Can your agency use its current rating & inventory data to show elected officials & public the impact of increases or decreases in agency's budgets on future pavement quality?



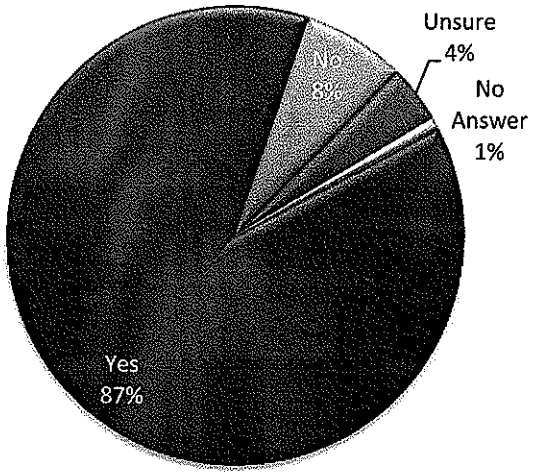
6) Does your agency periodically assess the benefit of pavement treatments with respect to cost?



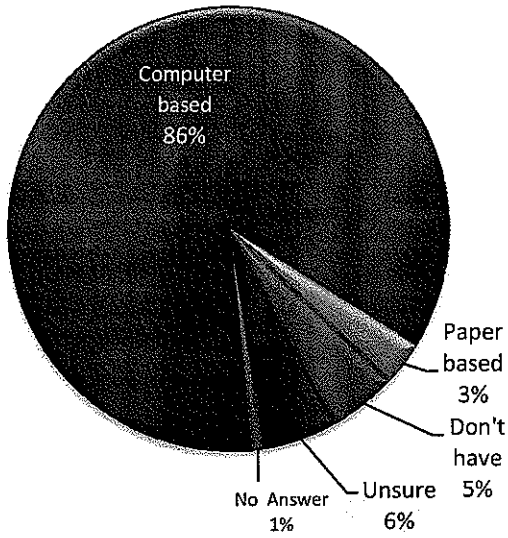
7) Which method best describes how your agency selects pavement treatment projects?



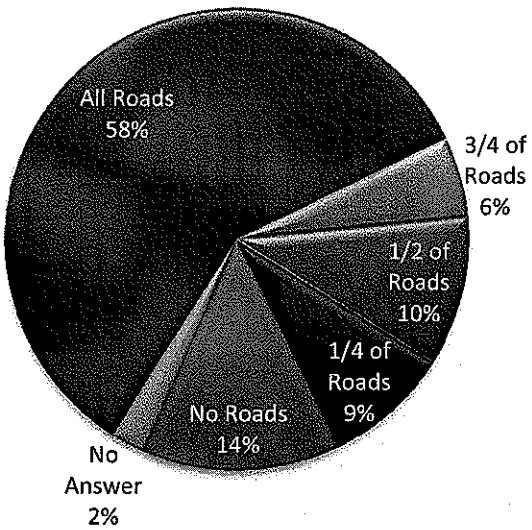
8) Does your agency consider PASER or other distress ratings when deciding on appropriate fix for a specific section of road?



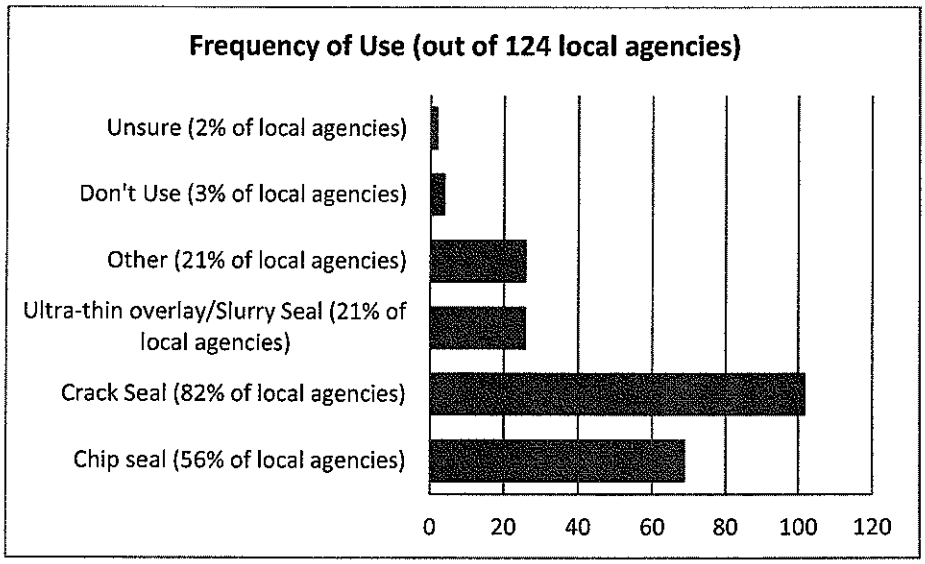
9) Does your agency use a computer based AM system or paper based AM system to guide decisions on your road network



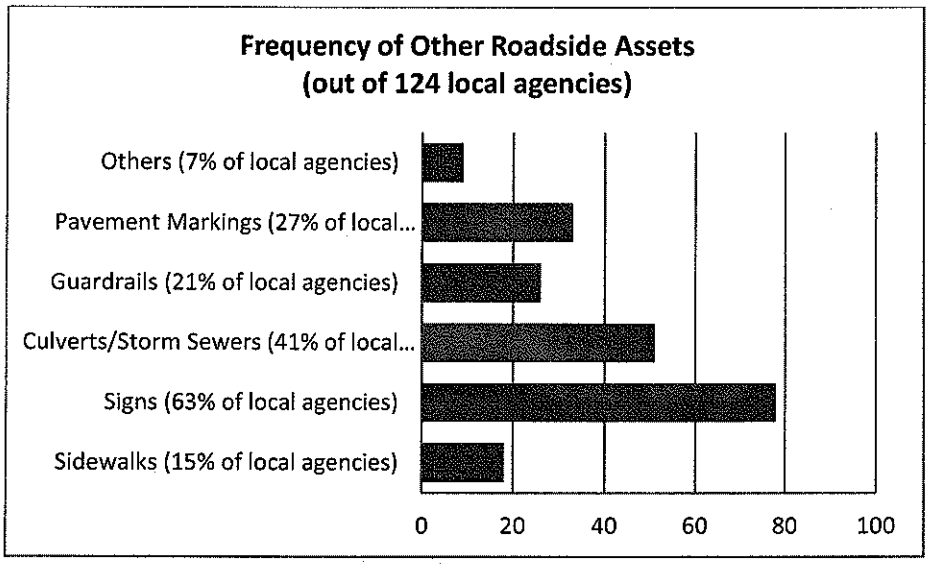
10) On how much of your non-federal-aid, paved road network does your agency routinely collect distress rating & inventory data?



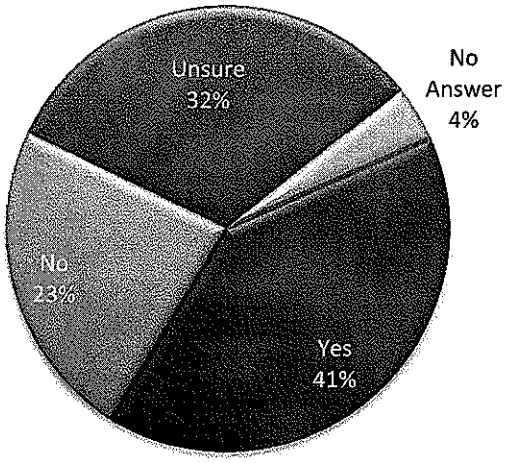
11) Which preventative maintenance treatments does your agency routinely use as part of their regular pavement management program?



12) On what other roadside assets does your agency routinely collect inventory or rating data for asset management?

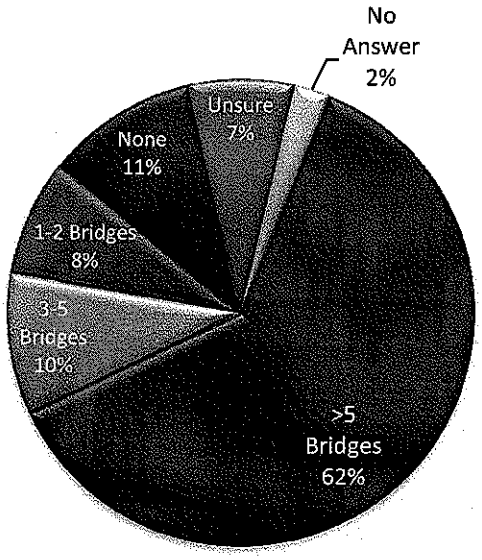


13) Does agency have a method in place for ensuring that the quality of your asset management data is sufficient for its intended use?



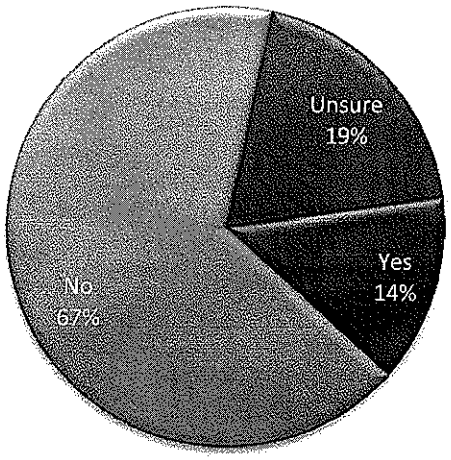
D-2 Local Agencies' Number of Bridges (out of 124 responses)

15) How many bridges with a span of over 20 feet does your agency own?

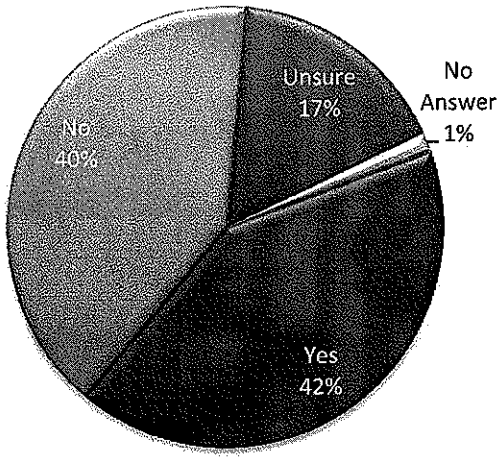


D-3 Bridge Answers (out of 72 responses)

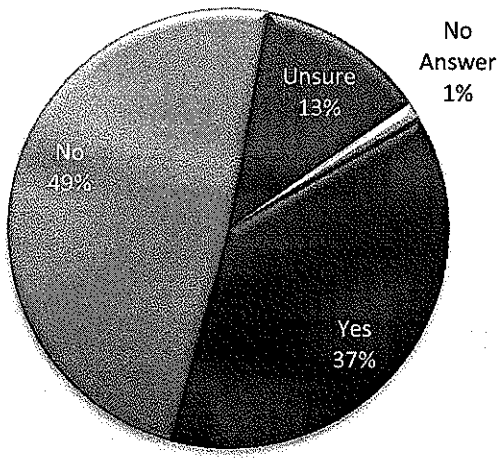
16) Does your agency have a written bridge asset management plan with defined goals for bridge quality?



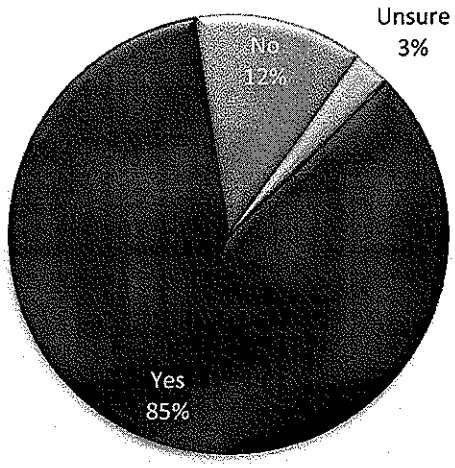
17) Does your agency use preventative maintenance treatments as part of regular treatment program for bridges?



18) Does your agency use a management system like RS to access NBI data and keep up-to-date bridge maintenance histories for the majority of its bridges over 20 ft.?



19) Does your agency use bridge condition data to make decisions regarding bridge maintenance and rehabilitation?



Appendix E – Written Comments

E-1 Pavement Asset Management Survey Question 14

What's one thing that TAMC should to do advance transportation asset management in Michigan?
Constructive Criticism
Find out why that all the educating the legislator's receive, does not light a fire to fund local road needs. Stress the fact that the paved system is only a small portion of the total road system needs.
Education general public about roadway conditions
Work with framework people to get them to update the RoadSoft framework base maps. Road names are wrong.
Allow for reimbursement of local data collection by other individuals trained internally by someone who attended training (summer help collects my local roads)
Help educate the public on the needs for public funding towards roadway construction projects.
Funding and statewide standard with guidelines.
Maintain "We are all in this together" philosophy.
Encourage legislature to give more funding
Make it mandatory for Council members and managers to go through PASER training and Asset MGMT training so that they understand the concepts
Provide stronger/more detailed info to public and elected officials on how funding affects road repairs and maintenance. That may help the public to better understand the need to increase road funding
Keep up with cost/benefit stuff as it relates to preventative maintenance
Keep educating the public and decision makers on the amazing capabilities of asset management. Save money/time.
Keep providing updates and training.
Provide road agencies with different maintenance repair activity strategies, associated costs for each, and estimated extension of pavement life for each different repair. This would allow road agencies to get away for the "political" road repair strategy of worst first.
Reduce funding for agency (cities and villages) that do not rate - get more federal money to the locals for road projects - some kind of MDOT oversight - the filter down system in place does not work well
Provide courses/presentations/materials to state and local elected officials, to continue to educate and convince them of the important to invest in infrastructure.
Perform PASER ratings on 100% of the paved road network both federal aid, non-federal aid system yearly. Consider starting a rating system on aggregate roadways primary & local.
Keep adding modules to RoadSoft. Each one seems to help greatly.
Never use data as part of funding distribution or funding formulas. Great tool to show public trends and transportation economics
Help agencies move from phase1 - just analysis of PASER data to using Roadsoft for future prediction of life
Continue to educate legislators and educate local officials. Keep advertising the value and use of the data.
Sample asset management programs, more graphics (this is already available, but it's very effective and we could use more).
Make all jurisdictions treatment DEF. the same and map all treatments for us so it is all the same
Continue to work towards educating local gov't officials such as township boards etc. the benefits of

asset management in making sound maintenance decisions.
Pay for all miles of roads. Helps justify time allocated to ratings.
Reach out to all tribes, villages, cities, planning comm., counties, and municipalities. Also encourage shared or cooperative responsibilities and projects.
Continue to educate individuals on Asset Management
More public awareness
General Comments/Suggestions
Keep doing the same.
Our Engineering staff/mgmt staff has shrunk (lack of financial wherewithal). We don't have an adequate number of hours to dedicate to AM - best help would be dedicated funding to hire add'l qualified, seasoned staff (not a green first-year student) for adequate time frame during entire year (50% half-time +-(
Explain it to accountants so they can understand and not object to tracking the customer date or require them through getting treasury on board.
Tell MDOT to back off the force account issue and quit pandering to MITA. Most force account projects focus on preventative maintenance. The MDOT reps on this board are not mid-level people. They can influence this issue.
Headed in the right direction. The easier to download and update data the better
Funding Comments
Convince legislature / public that AM works if properly Funded!
Get us more money so that we can implement the mix of fixes for our roads.
We need funding to follow a plan. And we can't keep up.
Find more funds to allow complete (100%) data collection on an annually basis not every third year.
Find a way to fund the fixes as required from the PASER ratings and Asset management recommendations
Funding!

E-2 Bridge Asset Management Survey Question 20

Is there anything else you'd like to tell us regarding asset management implementation?
Constructive Criticism
Get treasury to tell the accountants/auditors to have procedures to document the cost and values of roads and bridges based on condition, not years of depreciation.
Tablet (Ipad) LDC. Can it use GPS.
Possibly use Baraga/Houghton vs. Ishpeming
Local agencies have a lot of gravel roads which are not rated, but should be considered when evaluating the condition of roadway systems. i.e., gravel roads should count, e.g. Tourists do not like gravel roads.
Asset management is a good tool but should not be viewed by politicians as the "only" way of selecting road or bridge work!
More training for load ratings on bridges. More for rating all roads.
Implementing a PASER work group or task force and more training (field & RoadSoft) offered.
Happy that you have started a certification program, but feel that it should be 3 to 5 years in length (SESC is 5 yr.). Also feel that some consideration should be taken regarding input of data (PASER info into RoadSoft) along with conducting actual road ratings and evaluations to be eligible for PASER certification. Six years (5 if engineer) of attending the TAMC PASER onsite training, I feel, is a bit much. I

do realize experience is important but all experience regarding RoadSoft and PASER should have been considered.
Gravel roads program. Longer certification period.
Certification process does not extend enough. Engineer's less experience for eligibility?? (no basis) Should be 5 year cert. Reduce administrative expense of Asset Management by eliminating conferences. The conference attendees are the people who are familiar with Asset Man. Why expend money to preach to the choir? Stop reimbursement for asset management conference attendance. use funding for additional data collection.
I would like a class or webinar on bridge asset management. I'm not sure what capability RoadSoft has to perform this task?
General Comments/Concerns
Currently under the learning curve. No comments at this time.
The current system used to select bridge projects for PM through MDOT is bad, more projects for PM need to be funded.
The multi-year certification is a good thing for those who rate every year. Thank you.
The management of bridges in Gratiot County uses data from inspections, NBI & MDOT Bridge Inventory & Reporting to maintain the system of 120 bridges.
We have only one bridge that requires minimal maintenance. We do not need a formal system to evaluate / quantify needs for one good-quality bridge. We're thankful this is not an issue for us.
We fear that data may be used to penalize agencies with higher ratings to better fund agencies including MDOT with lower ratings. What about gravel roads?
We access bridge data on MDOT's bridge database.
Appreciate the training opportunity. Nice if there was a generic PowerPoint to show council about the benefits
This is a good program for presenting the conditions of road assets, the case for increase in funding, and the effects of investing or not investing has on the system.
Equally important = the condition of our underground utilities. In our case, condition/performance of water/sewer main drives investment in streets for structural improvements and planning efforts.
We utilize a consulting engineering firm for our bridge inspection and evaluation needs.
This is my first year in this position and a plan to establish a road rating system using RoadSoft
Nope! Good job!
Funding Comments
AM requires a dedicated revenue stream to implement. Maintenance money does NOT cover AM!
Unfunded so we do not do.